

Announcing—



the new "900" series
BUCKEYE Heatovent

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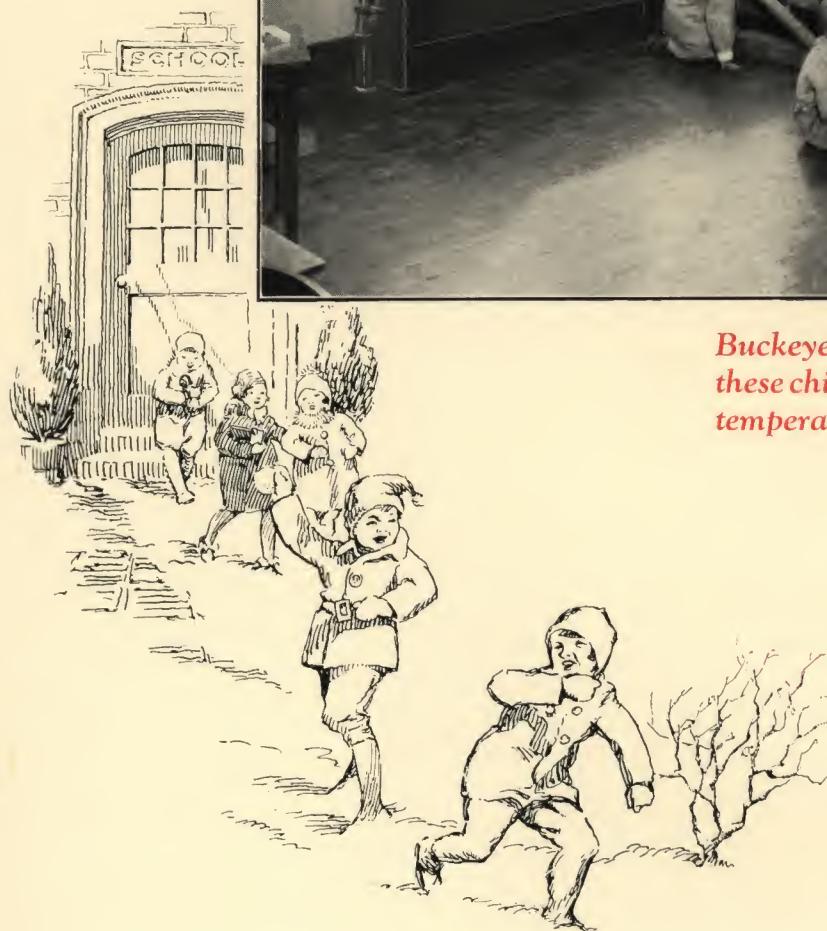
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COLUMBUS, OHIO

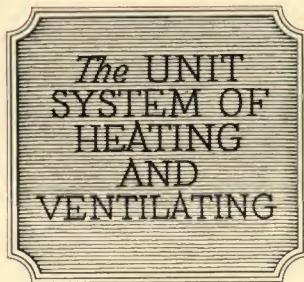
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**Buckeye Heatovents protect the health of
these children and maintain a comfortable
temperature without drafts at the floor**



The
BUCKEYE Heatovent
900
SERIES



BULLETIN 124
January 1929

THE BUCKEYE BLOWER COMPANY

Main Office
& Factory



Columbus,
Ohio

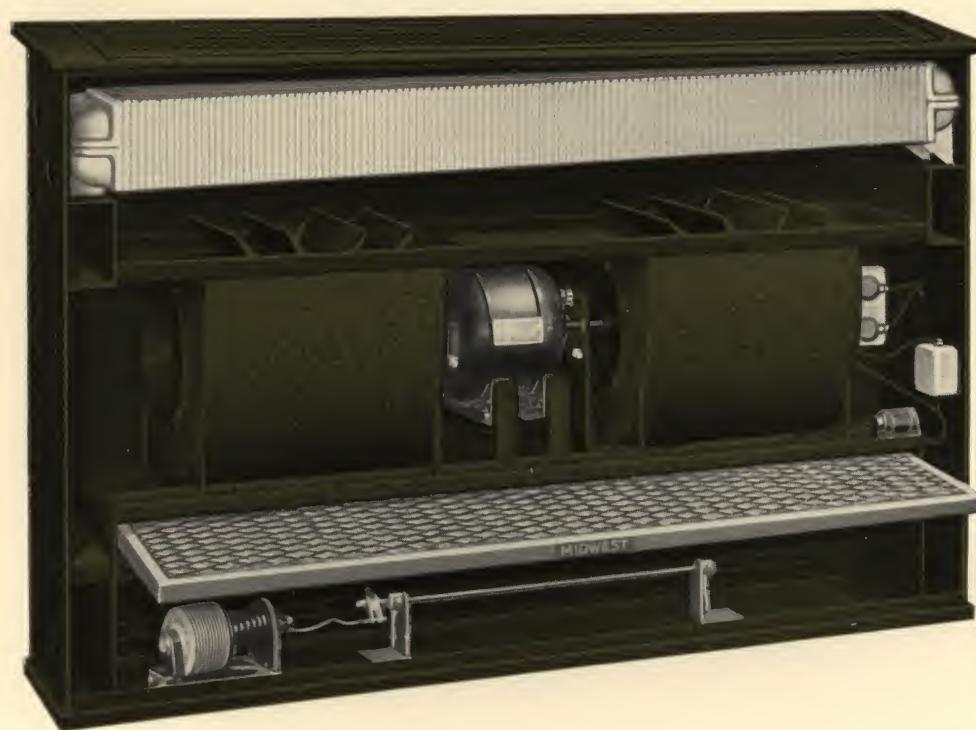
Branch Offices in Principal Cities. See inside front cover.



**Exterior View
Standard
900 Series
Buckeye
HeatOvent**

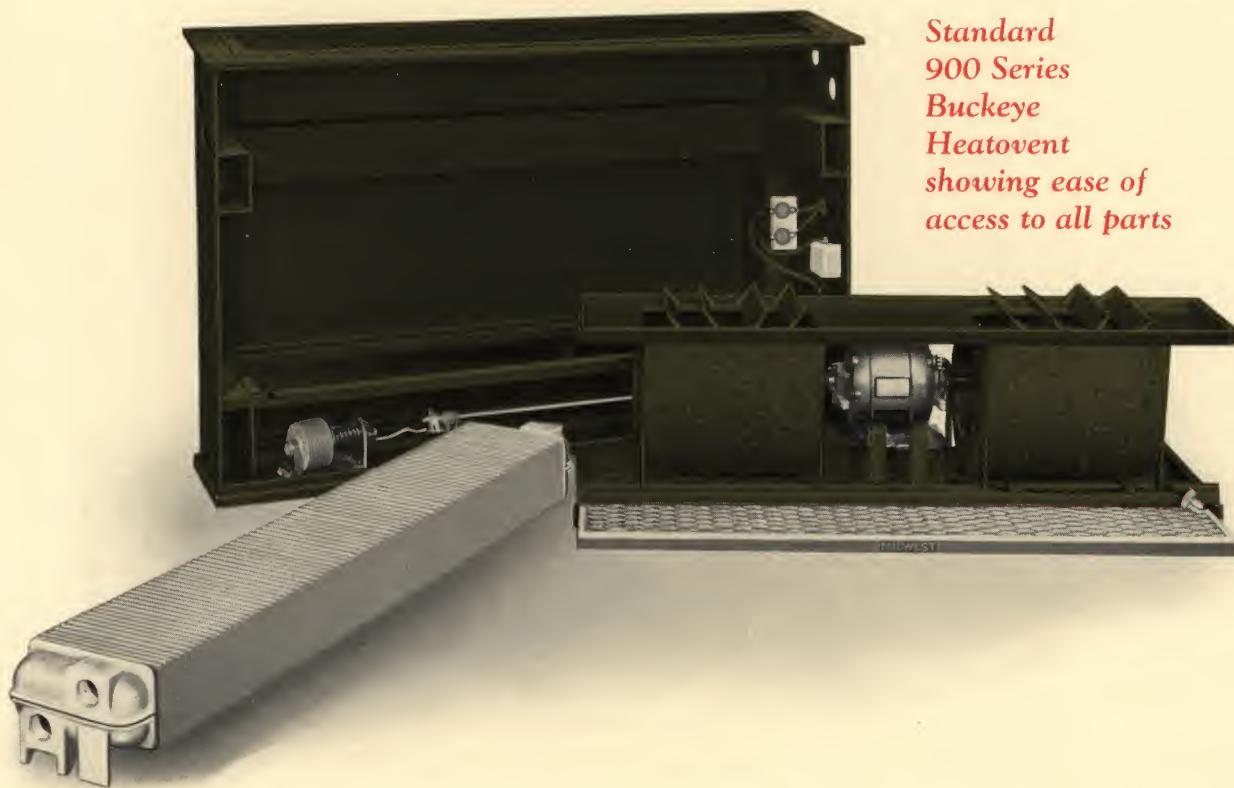


**Interior View
Standard
900 Series
Buckeye
HeatOvent
showing ease of
removing Filter**





**Standard
900 Series
Buckeye
Heatovent
showing ease of
access to all parts**



The 900 Series Buckeye Heatovent has been designed to meet the demand for a lower unit; one requiring less aisle space and performing a heating duty superior to anything heretofore accomplished.

**Why the
900 Series
Buckeye
Heatovent?**

It is designed for automatic control and eliminates the overheating and cold draft difficulties encountered in many other systems.

The fundamental principle of the 900 Series Unit is not new. It is simply a better method of applying our education in heating and ventilating to make a more compact unit—a unit which permits complete control under all temperature conditions.



Introduction

The 900 Series Buckeye Heatovent is the solution to a constantly growing demand for a unit ventilator, more compact and just as dependable as the 100 Series Buckeye Heatovent.

It is natural that the 900 Series should be measured with the standards established by our tried and proven 100 Series Unit.

This new and worthy member of the Buckeye Family was made possible only thru the invaluable education which we acquired during the years spent in developing and perfecting the 100 Series Buckeye Heatovent, long recognized as the standard in unit ventilation.

History and Development

The 900 Series Unit is simply a new application of these proven principles—a new method of applying what we have learned thru these many years of effort, to build a better unit.

How well we have succeeded in these efforts can best be appreciated if you will note the progress recorded by The Buckeye Blower Company in recent years, and by the enviable reputation earned and enjoyed by its products.

Cast Iron Overheating

In the early days of unit ventilation with the heating element of cast iron, prevention of overheating was impossible due to the latent heat in the mass.

Cold Drafts

Efforts to eliminate this overheating with the cast iron radiator resulted in cold drafts.

Steel

Efforts to overcome these difficulties resulted in the use of steel pipe coil radiators of greatly reduced mass, which, while not entirely satisfactory, marked a long step forward. In fact this improvement alone established unit ventilation as the most satisfactory method of introducing fresh air into a building.

Copper

Further efforts to reduce the mass in the radiator resulted in the adoption of copper tubing. This made possible a lighter, more compact radiator—a radiator capable of instantaneous response to temperature control.



Today practically all unit manufacturers have incorporated a copper radiator of some type in their products.

This extremely active radiator demanded a sensitive method of control. All methods of control in use, prior to the development of the copper tube radiator, proved wholly inadequate.

Because the radiant heat from the radiator increased the temperature of the air as it went from the bypass to the outlet grille, any unit with a damper mechanism not entirely enclosing the radiator, could not help but overheat.

In moderate weather this overheating could not be controlled unless additional automatic temperature control were placed on the radiator itself to control the steam after the mixing damper functioned.

Then came the 100 Series Buckeye Heatovent.

In the 100 Series Buckeye Heatovent our engineers designed a bypass and mixing damper mechanism that entirely encloses the radiator and cuts the radiation off from the bypassed air. The 100 Series Buckeye Heatovent will deliver bypassed air within five degrees of the outside temperature when desired, without the necessity of any automatic temperature control on the radiator to check overheating.

**The Patented
Buckeye Damper
Mechanism**

The patented Buckeye Intake Damper Mechanism has a positive lock action which holds it securely against the felt seating in either the open or the closed position. Thus overheating and cold draft difficulties were overcome. The Buckeye Blower Company overcame them with its damper mechanism in the 100 Series Buckeye Heatovent.

**Overheating
Eliminated**

Next came the problem of frozen radiators. Under certain conditions it is humanly impossible to prevent radiators from freezing. Intake dampers are supposed to be closed by the janitor when the fires are banked for the night.



With freezing outside temperatures, if the intake dampers are not closed a condition exists of condensed steam in the radiators and freezing outside air coming in thru the open intake dampers. Under such conditions there is nothing to prevent freezing of the radiators which causes many bursted radiators.

Again the engineers of The Buckeye Blower Company overcame this condition by developing a radiator which does not burst from freezing.

The Buckeye Copper Tube Radiator, which freezing does not harm The result is a tube and header construction of spring copper that allows for the expansion during freezing. These tubes will not burst from freezing —furthermore the greatest expansion resulting from freezing of the condensed steam in the tubes is less than one-half the expansion of which these tubes are capable without permanently affecting their shape.

The Buckeye Copper Tube Radiator is the result of long experience and was developed to meet the specific and exacting requirements of unit heating and ventilating.

Freezing does not harm the Buckeye Copper Tube Radiator.

This Heatovent construction is shown in our catalog describing the 100 Series Buckeye Heatovent. We have had excellent results with this type unit, in fact we know of no other unit on the market today, with the exception of our 900 Series Unit, that is capable of the control shown by the 100 Series Unit. We are satisfied that this unit can at least hold its own in any competition.

In the 100 Series Unit we have reduced overheating and cold draft troubles to the minimum possible in a damper type regulated unit. This has been accomplished in the 100 Series Unit by means of the Buckeye Damper Mechanism without the necessity of placing temperature control on the radiator itself. We have refrained from placing any method of temperature



control on the radiator itself in the 100 Series Unit because the volume of steam contained in the radiator after the valve is shut off would quickly condense and cause a very high vacuum. This vacuum would hold the water in the radiator and, unless unit be also equipped with the Buckeye Damper Mechanism, a blast of cold air going thru the unit would soon freeze the radiator.

However there is now a growing demand for a unit that in addition to performing its ventilating duty at all times, will also,

1. Have the capacity to perform its full heating duty in severe sub-zero weather.
2. Be capable of complete and accurate automatic temperature control in sub-zero weather and not overheat in mild weather.
3. Have a radiator that repeated freezing does not harm.
4. Occupy less aisle space and be of a height that may be installed under practically all windows.

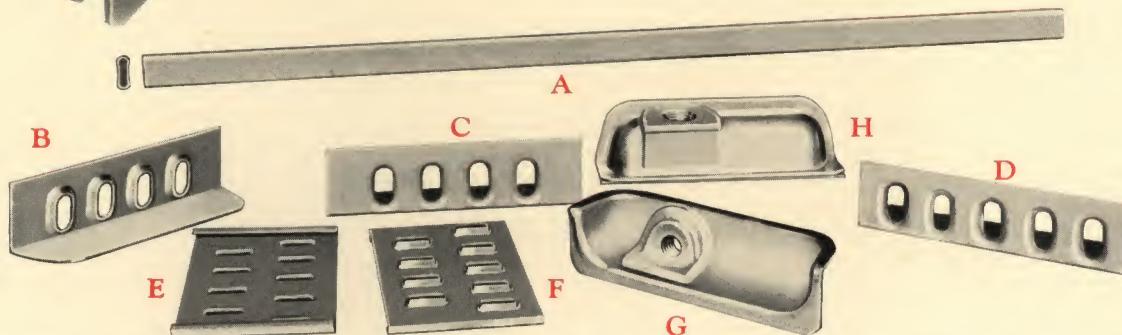
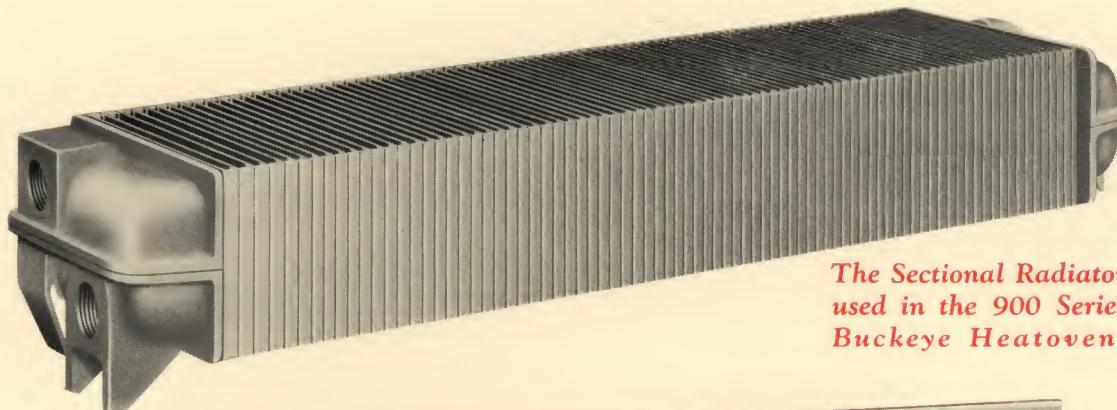
To supply that demand The Buckeye Blower Company has developed, tested, and approved the 900 Series Buckeye Heatovent which we now present for your consideration.

To meet these requirements we applied to unit heating and ventilating the experience gained from steam blast and split steam installations in which the radiator is divided into tempering and reheating sections so that in moderate weather one section could be entirely cut off and the other section throttled as the temperature conditions required. In this way we can put sufficient heating capacity in the unit to cope with severe sub-zero temperatures and still eliminate overheating in mild weather.

With this idea in view we have divided the radiator in the 900 Series Unit into two sections each to have an automatic gradual acting control valve on the steam supply. The bottom section is used to temper the incoming air sufficiently to prevent the upper section from freezing when the automatic valve on the upper section is closed.

**The Need for
the 900 Series
Buckeye
Heatovent**

**The Sectional
Radiator**



Radiator parts: A - Tube; B - Lower Radiator Tube Sheet, inside, C - outside, D - Upper Radiator Tube Sheet; E-F - Radiator Fins; G-H - Header, inside and outside views

**Accurate
Temperature
Control Assured**

With this arrangement both the upper and lower sections can be controlled by a room thermostat with a gradual acting valve on each section, so arranged that the top section shuts off first followed by the gradual throttling of the steam supply to the bottom section.

A duct stat can be located in the unit and set for a minimum temperature at which point this stat will open the bottom section steam valve and if necessary the top section valve admitting steam to one or both sections, even though the room thermostat is not calling for heat.

**Protection
against freezing
and cold drafts**

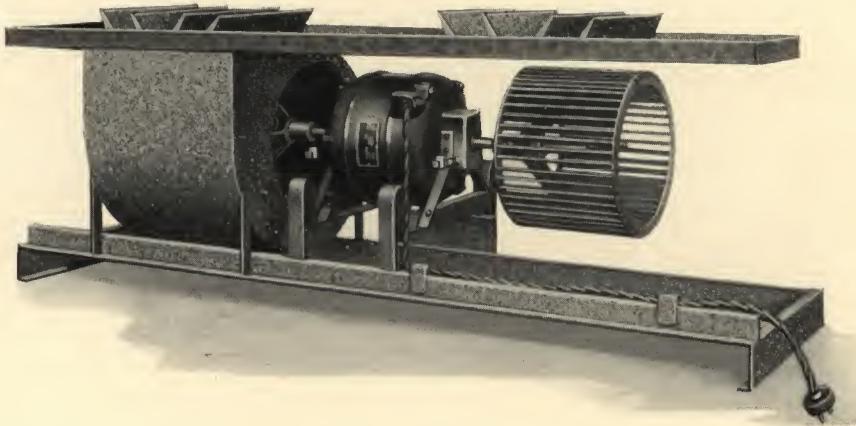
This arrangement takes care of a condition similar to the following; with zero weather and a room temperature of 71 degrees, the room thermostat therefore having closed the steam valve on both sections, the duct stat in the unit



admits sufficient steam into the radiator to prevent cold drafts, even though the room thermostat is still not calling for heat.

The heating element in the 900 Series Unit is the two-section Buckeye Copper Tube Radiator which freezing does not harm.

The 900 Series Unit has the same type intake damper, filter, motor, fan wheels, fan housing, etc., as the standard 100 Series Buckeye Heatovent.



The 900 Series Unit like all other Buckeye Heatovents is equipped with Buckeye Multiblade Fans. The Power Plant assembly illustrated above has one fan housing removed to show one of the Buckeye Multiblade Fans.

The Buckeye Blower Company, for many years, has been a large manufacturer of all types of fans for special purposes, and has the experience and facilities to build any type of fan. Buckeye Heatovent Units are equipped with multiblade fans because the multiblade fan has long since demonstrated its superiority for unit ventilating work in thousands of installations.

This 900 Series Unit is designed to be recessed into the wall the depth of one brick to a height of 24" above the finished floor. This leaves the unit projecting only 9 $\frac{1}{2}$ " into the room. The maximum height of this unit is 34".

**Requires
less space**

Hayes School, Lakewood, Ohio
Howell & Thomas, Architects



Oxford School
Cleveland Heights, Ohio
John H. Graham Co., Architects

BUCK
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Laurel School for Girls, South Euclid, Ohio
John H. Graham Co., Architects



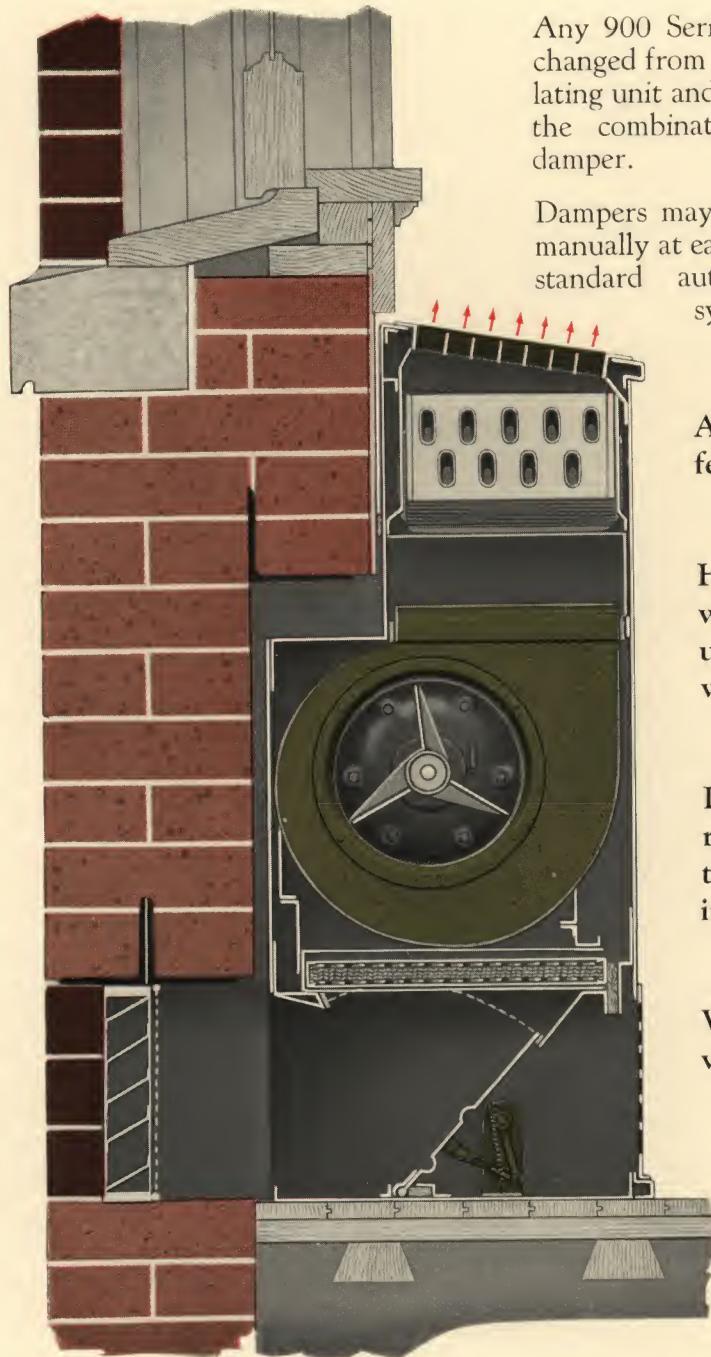
KEYE
event



Church at J.O.U.A.M.
National Orphan's Home, Tiffin, Ohio.
Architect: Robert B. Hunter, High Point, N. C.



Cross Section of
900 Series
Buckeye
Heatovent
recessed



Any 900 Series Buckeye Heatovent can be changed from a non-recirculating to a recirculating unit and vice-versa by merely operating the combination intake and recirculation damper.

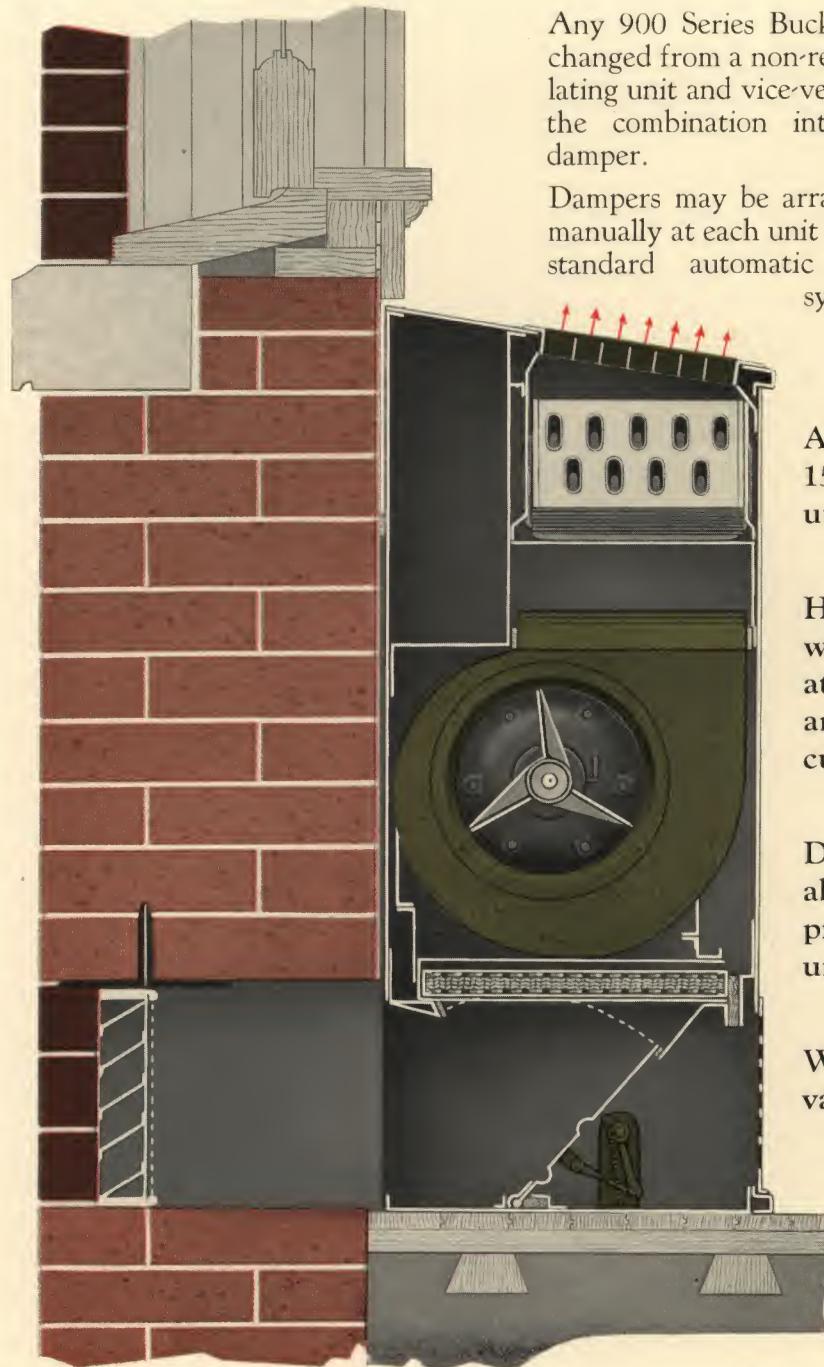
Dampers may be arranged to operate either manually at each unit or automatically by any standard automatic temperature control system.

Air Delivery: 600 to 1500 cu. feet per minute.

Height: Only 34 inches---- which permits installation under practically any window without cutting off light.

Depth: Only $9\frac{1}{2}$ inches when recessed--less aisle projection than the average 3 column iron radiator.

Width: 20 to 60 inches, varying with capacity.



Any 900 Series Buckeye Heatovent can be changed from a non-recirculating to a recirculating unit and vice-versa by merely operating the combination intake and recirculation damper.

Dampers may be arranged to operate either manually at each unit or automatically by any standard automatic temperature control system.

Air Delivery: 600 to 1500 cu. feet per minute.

Height: 34 inches---- which permits installation under practically any window without cutting off light.

Depth: 14 inches---- about the same aisle projection as a 3 column radiator.

Width: 20 to 60 inches, varying with capacity.

**Cross Section of
900 Series
Buckeye
Heatovent
not recessed**



Exterior view

**The DeLuxe
900 Series
Buckeye
Heatovent**

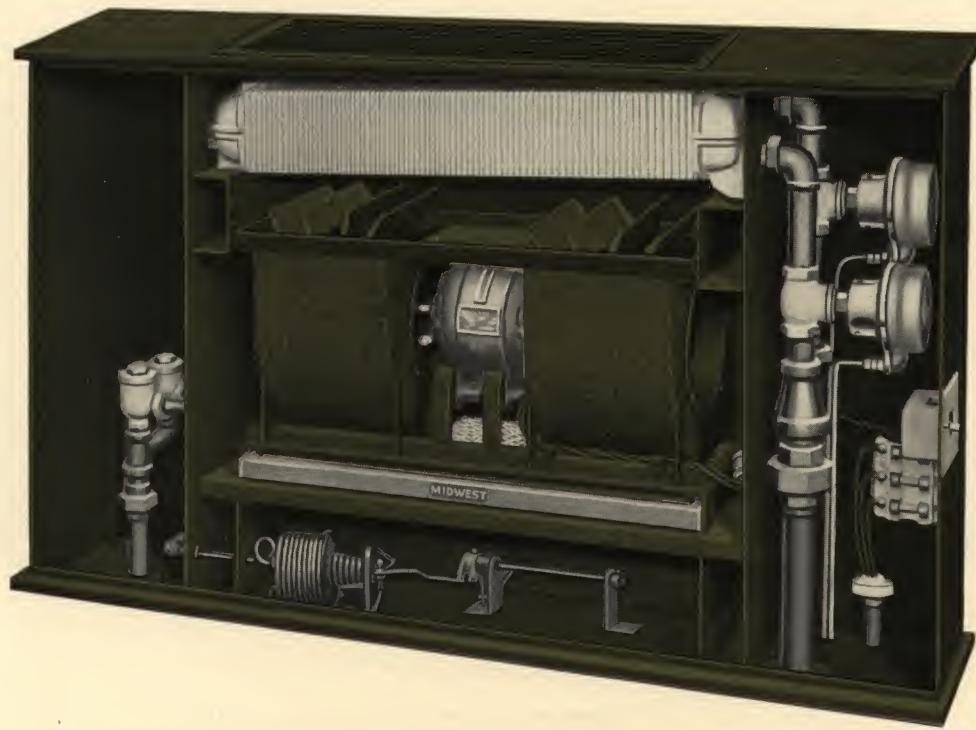


**The DeLuxe
Unit**

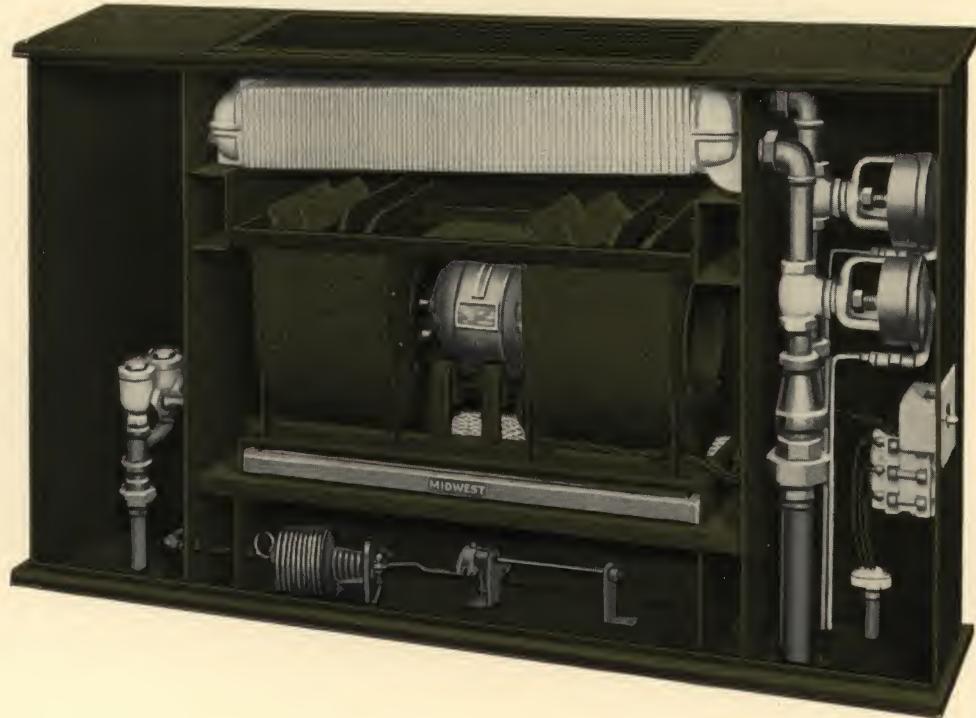
The De Luxe Unit is meeting with hearty acceptance and approval by architects everywhere. This unit fully conceals from view all piping, valves, traps, wiring, outlets, etc.

We believe this results in one of the greatest improvements in the appearance of unit ventilators.

This feature is of even more importance from a safety viewpoint, especially when the units are to be installed in schools, hospitals, sanitariums, asylums, churches, gymnasiums, pools, etc., because it removes the possibility of anyone coming in contact with the heated pipes. The slightly increased cost is more than justified by this safety feature alone.



Interior view
The DeLuxe
900 Series
Buckeye
Heatovent
showing Auto-
matic Control
Valves





Standard
900 Series
Buckeye
Heatovent
showing
accessibility



Note that the Filter may
easily be taken out for cleaning by simply removing the
front cover. No other part of the machine need be disturbed.
The Power Plant may readily be lifted out --- no tools being necessary.





We advocate a unit capable of recirculation, for the following reasons: When heating up a building in the morning before the rooms are occupied much time and fuel can be saved by recirculating the air in the room with the outside intake damper closed until the desired room temperature is reached. Then the intake damper should be opened so that the fresh outside air, heated to the proper temperature by the unit is supplied to the room.

Recirculation

Some states prohibit recirculation while the rooms are occupied for school purposes. This does not prevent recirculation to quickly heat up the rooms before they are occupied. Shortly before the pupils arrive the intake dampers are opened to admit outside air in which position they close the recirculating opening and when school starts the rooms are thoroughly ventilated with fresh air, properly heated. As this is becoming better understood, more and more states are advocating this recirculation, for heating the buildings in the morning before they are occupied.

Both the 100 Series and the 900 Series Buckeye Heatovents are particularly satisfactory where a recirculating type unit is called for, because they do not overheat even in mild weather.

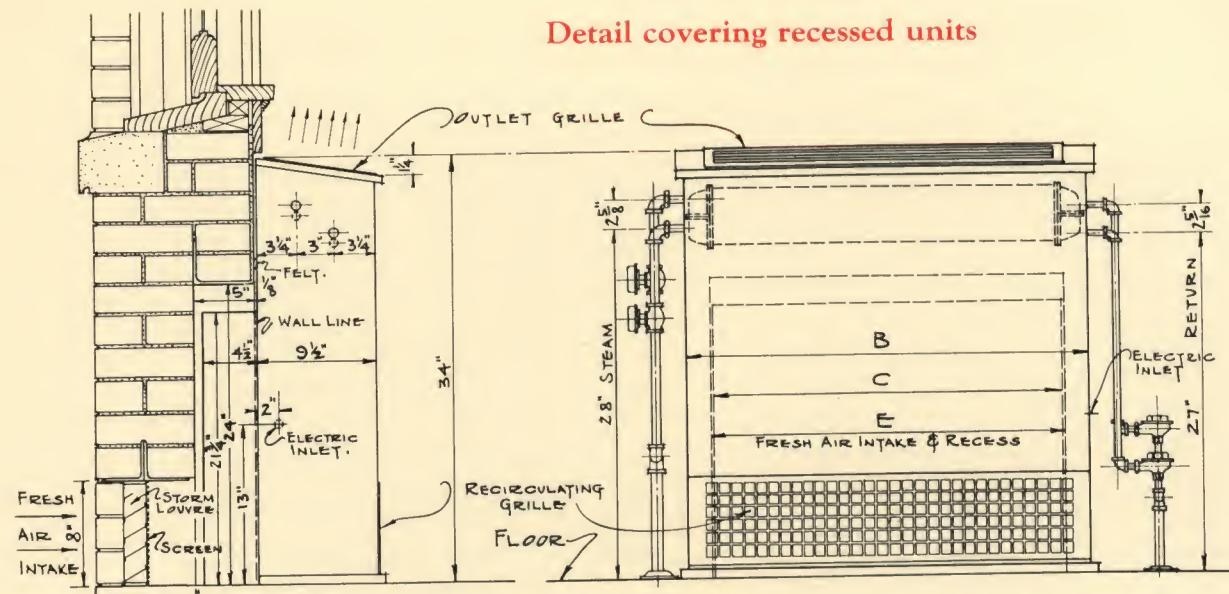
The Engineers of The Buckeye Blower Company in designing the Buckeye Heatovent were fully awake to the advantages of this recirculating feature. Buckeye Heatovents can be changed from non-recirculating to recirculating units by merely operating the combination intake and recirculation dampers.

The design of the Buckeye Heatovent permits this recirculating feature without requiring additional aisle space. The 900 Series Buckeye Heatovent with or without the recirculating feature projects only $9\frac{1}{2}$ " into the aisle.

Buckeye Heatovents can be equipped when desired with Electrozones for increasing the volume of ozone supplied to the rooms. This method of purifying the atmosphere is nature's method. Thru the agency of thunderstorms which generate ozone in considerable quantities with each lightning flash, the atmosphere becomes charged with this very active substance which combines chemically with many gases, etc., changing them into forms that are beneficial to health. The freshness and purity of the atmosphere immediately after a thunderstorm is explained by the generation of ozone. We are therefore adopting nature's method of air purifying and applying it to unit ventilation, thus producing a condition of greater purity in the air supplied to the rooms, than exists in the outside air, which we call fresh air.

Ozonation

Detail covering recessed units

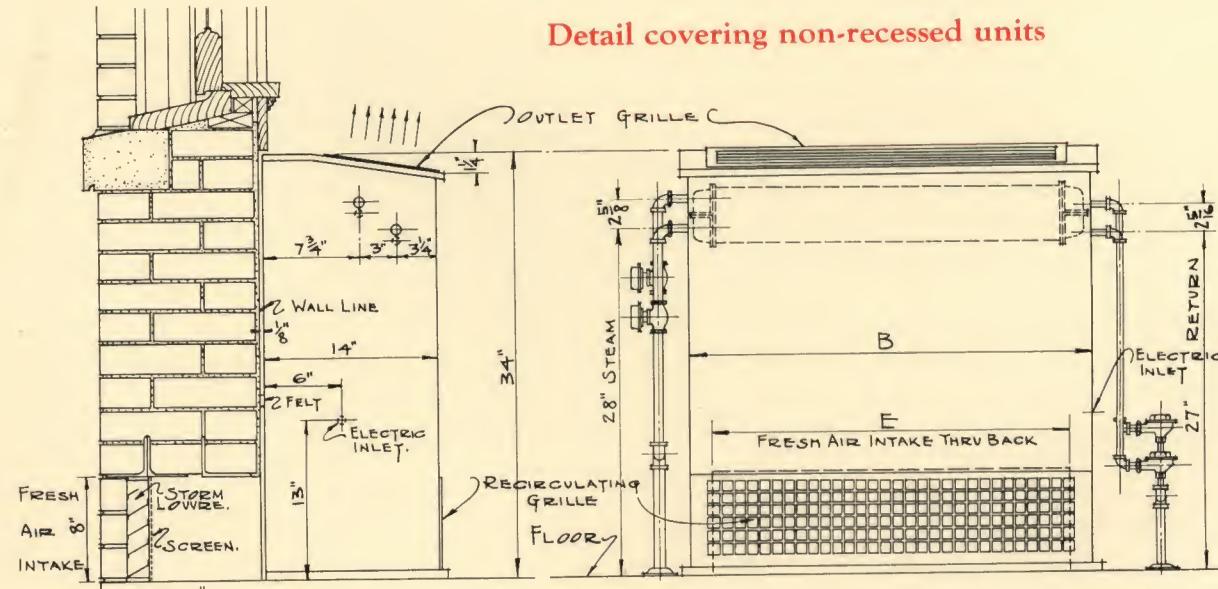


NOTE THAT BOTTOM OF INTAKE SHOULD BE LEVEL WITH FINISHED FLOOR LINE

**Following table shows 900 Series Dimensions
common to both recessed and non-recessed units**

Unit No.	C. F. M.	B	C	E	Steam	Return
926 to 929	600	26	21 1/2	22	2-1"	2-3/4"
936 to 939	750	32	27 1/2	28	2-1"	2-3/4"
946 to 949	1000	40	35 1/2	36	2-1"	2-3/4"
956 to 959	1250	50	45 1/2	46	2-1 1/4"	2-1"
966 to 969	1500	60	55 1/2	56	2-1 1/4"	2-1"

Detail covering non-recessed units



NOTE THAT BOTTOM OF INTAKE SHOULD BE LEVEL WITH FINISHED FLOOR LINE

Engineering Data on 900 Series Buckeye Heatovents

Room Temperature 70 degrees Fahr.				Steam at five pounds gauge pressure									
Entering	Air	C. F. M. Air		-20°F		-10°F		0°F		+10°F			
Unit No		Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.
926	600	68	242	-----	74	227	11	80	214	27	85	199	40
927	600	85	278	40	90	263	53	95	247	65	99	234	76
928	600	100	311	78	104	293	87	107	273	94	111	259	105
929	600	111	332	104	115	315	113	118	295	120	121	281	134
936	750	68	302	-----	74	284	13	80	268	34	85	248	50
937	750	85	348	50	90	329	66	95	309	81	99	293	95
938	750	100	388	97	104	366	109	107	341	118	111	324	132
939	750	111	415	130	115	393	141	118	368	150	121	351	161
946	1000	68	402	-----	74	378	18	80	357	45	85	331	61
947	1000	85	463	66	90	438	88	95	412	108	99	390	127
948	1000	100	517	129	104	488	146	107	455	157	111	432	175
949	1000	111	554	173	115	525	189	118	491	200	121	468	215
956	1250	68	503	-----	74	473	22	80	446	56	85	414	83
957	1250	85	579	83	90	527	105	95	515	136	99	488	159
958	1250	100	646	162	104	610	182	107	569	197	111	530	215
959	1250	111	692	216	115	655	236	118	614	250	121	586	269
966	1500	68	604	-----	74	568	27	80	535	67	85	497	99
967	1500	85	696	100	90	657	132	95	617	162	99	585	191
968	1500	100	775	194	104	731	218	107	682	236	111	647	263
969	1500	111	830	259	115	786	283	118	736	293	121	703	323

Engineering Data on 900 Series Buckeye Heatovents

Room Temperature 70 degrees Fahr.				Steam at five pounds gauge pressure									
Entering	Air	C. F. M. Air		+30°F		+40°F		+50°F		+60°F			
Unit No		Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.	Final Temp.	Total E. D. R. Sq. Ft.	Excess Heat Sq. Ft.
926	600	96	172	68	101	157	80	106	143	92	112	131	106
927	600	108	199	97	113	184	108	117	168	118	122	154	129
928	600	119	222	122	123	205	131	126	187	138	130	171	147
929	600	128	241	143	131	222	149	134	202	154	138	188	164
936	750	96	215	85	101	196	100	106	178	114	112	164	132
937	750	108	248	121	113	230	135	117	209	147	122	192	161
938	750	119	278	153	123	256	163	126	234	172	130	212	182
939	750	128	301	178	131	278	186	134	255	194	138	235	205
946	1000	96	286	113	101	261	132	106	238	153	112	219	177
947	1000	108	331	161	113	307	181	117	279	196	122	256	215
948	1000	119	371	204	123	342	218	126	312	230	130	286	245
949	1000	128	402	238	131	371	249	134	340	259	138	314	274
956	1250	96	357	141	101	326	166	106	297	191	112	274	222
957	1250	108	413	201	113	384	226	117	349	245	122	319	267
958	1250	119	463	255	123	427	272	126	390	288	130	357	306
959	1250	128	502	297	131	463	311	134	426	324	138	393	342
966	1500	96	428	169	101	392	199	106	356	229	112	329	266
967	1500	108	496	242	113	460	271	117	419	294	122	384	322
968	1500	119	555	305	123	512	327	126	468	345	130	428	368
969	1500	128	602	356	131	557	373	134	511	389	138	472	411



BUCKEYE Heatovent

Typical Specifications for 900 Series Buckeye Heatovent (Automatic Control)

Unit Heaters:

1. Heating and ventilating contractor shall furnish and install complete and ready for use, 900 Series Buckeye Heatovents of number, size and type shown on plans and specified herein.
2. Buckeye Heatovents shall be guaranteed to deliver the full volume of air shown on plans and specified herein, and to raise temperature of air fromF. toF. with steam at five pounds pressure at radiator for a continuous run of 72 hours without undue noise or overheating of motor.
3. Unit fans shall be of the slow speed multiblade type operating at a tip speed not greater than 1500 feet per minute when delivering their full rating against the resistance of the unit.
4. Motors shall be designed to operate onphase,cycle,volt alternating current or direct currentvolts, and shall have ample power to drive fans continuously with a temperature rise not to exceed 40° C.
5. Each Buckeye Heatovent shall have an individual key-operated switch entirely wired within the unit, wiring terminating at a porcelain fuse block with binding post to which electrical contractor will make all electrical connections to unit heaters.
6. Radiators shall be constructed entirely of copper with no soldered joints, seams, or gaskets, and all prime surface shall be seamless drawn copper tubing provided with copper fins metallically bonded to tubes. Tubes and headers shall be electrically welded together. Radiators shall be guaranteed to withstand freezing without bursting. Each Buckeye Heatovent radiator shall be divided into a double heating unit and provided with individual steam connections so that either part of heating element can be used independently of the other or the entire radiator used if required to meet the demand of the heating load.
7. No mixing or bypass dampers are to be used with this arrangement as all air delivered to the room must pass thru the radiator so that the temperature of the air entering the room
- can be controlled at all times to meet the demand of the regulation system.
8. No Buckeye Heatovent shall project into the aisle of the room more than 9½" and shall be installed in accordance with details furnished by manufacturer.
9. Regulation contractor is to furnish heating contractor two diaphragm supply valves to be installed on supply connections of unit radiators. Unit manufacturer is to furnish special Tee connections for both supply and return pipes.
10. Each unit shall be provided with a damper to close the fresh air intake.
Use only one, either 10A or 10B
 - 10A. These dampers shall be manually operated.
 - 10B. These dampers shall be operated by damper motors furnished under the automatic temperature regulation contract and they shall be operated by a three-way switch in the basement.
11. Buckeye Heatovent cabinets shall be constructed of full finished furniture steel of not less than No. 14 gauge with crystalline green enamel baked on. Unit shall be provided with suitable locks and locking type motor switch and extra keys shall be provided. All parts of cabinet shall be easily accessible for cleaning.
12. Masonry contractor will leave fresh air intake openings and set all fresh air louvres in place as the work progresses but ventilating contractor shall be responsible for proper size and location of all openings. Fresh air louvres shall be 32 oz. copper with ½" square mesh wire screen behind louver.
13. Plastering contractor will leave recess in plaster behind each Buckeye Heatovent, recess to be strictly in accordance with details furnished by unit manufacturer. Heating and ventilating contractor shall be responsible for the proper size and location of all recesses as unit roughing-in measurements must center with recesses. Units supported on walls shall be



mounted on cast iron wall brackets furnished by unit manufacturer, but masonry contractor will set wall brackets in walls as directed by heating contractor.

14. All unit heaters shall be provided with air filters so placed as to be easily accessible and removable for cleaning. Filters shall be of adhesive type and installation shall be complete with necessary cleaning and oiling vats.

Inserts For Other Trades:

Insert For Electrical Specification

15. Electric contractor shall furnish and install a complete system of wiring to all of the ventilating units shown on the plans, providing for each Buckeye Heatovent a 150 watt outlet.

16. Electrical contractor shall make all electrical connections and do all wiring necessary for the operation of the ventilating units, fans, etc., furnished by heating contractor.

Insert For Masonry Specification

17. Masonry contractor shall provide fresh air openings thru walls for the ventilating units,

furnish lintels for same, and shall set the storm louvers in these openings. The storm louvers and detail drawings for their proper location shall be furnished by the heating and ventilating contractor.

Insert For Plastering Specification

18. The plastering contractor shall leave recess in plaster behind each Buckeye Heatovent, recess to be in accordance with details furnished by unit manufacturer. The heating and ventilating contractor will be responsible for the proper size and location of all recesses.

Automatic Temperature Regulation:

19. In all rooms having ventilating units and direct radiators there shall be installed a thermostat which will control the valves on direct radiation and the two heating sections on each unit heater with a gradual action. The temperature control apparatus shall also be capable of further controlling the lower section in the unit so that the incoming air must be tempered at all times regardless of the room temperature. The temperature regulation company shall furnish all diaphragm valves for radiators, all intake damper motors, relays, piping, etc., necessary for the complete temperature control system.

**Typical
Specifications
for 900 Series
Buckeye
Heatovent
(Automatic Control)**



Guarantee

All Buckeye Products are fully guaranteed. Any parts proving defective within two years after installation, will be replaced promptly, without expense to owners, upon notification to either our main office or our nearest branch office.

All Buckeye Unit Ventilators and Unit Heaters are guaranteed to deliver their full volume of air at not less than final temperature shown in engineering tables of our catalogs.

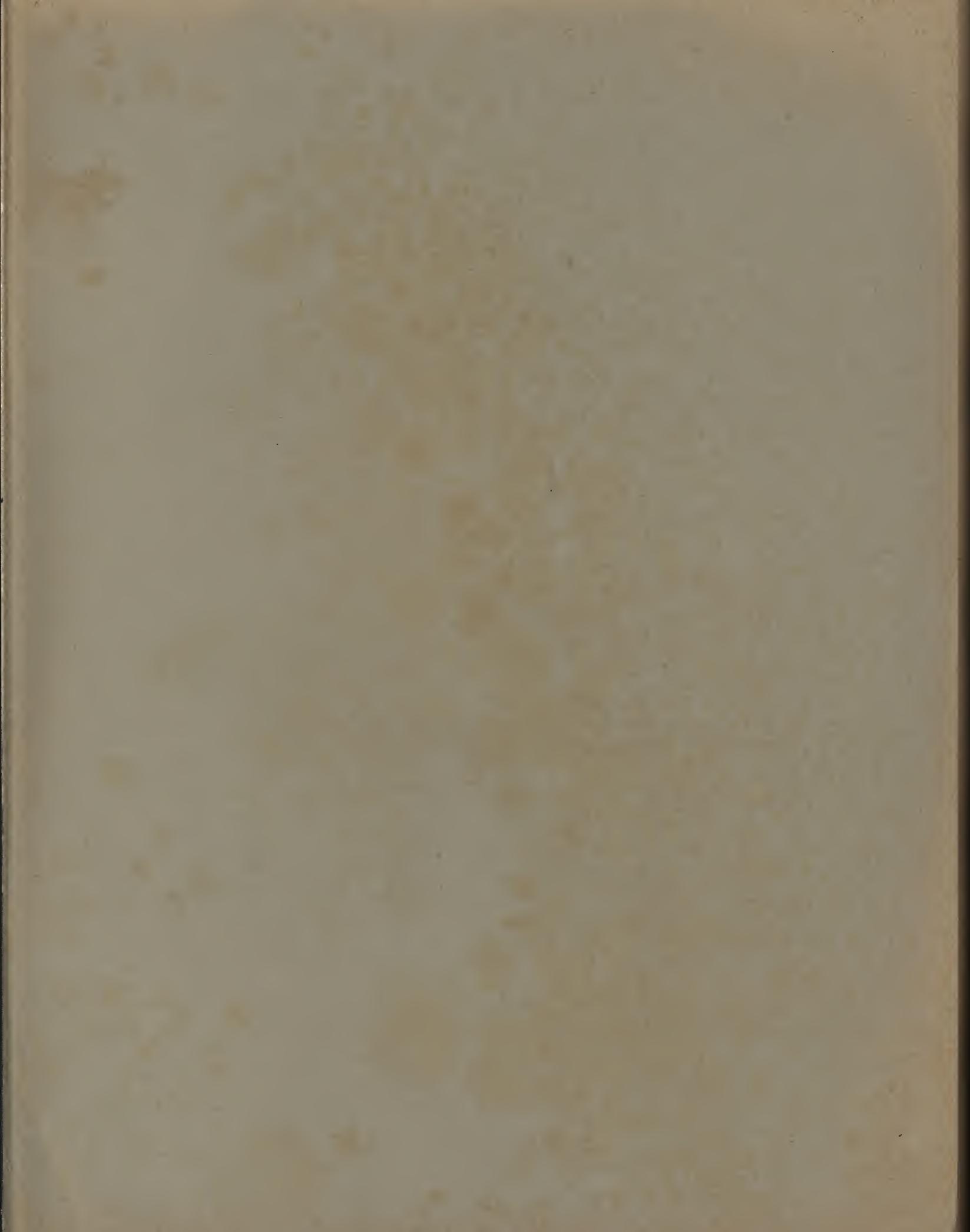
If specific guarantees are required on any Buckeye Product, please communicate with our main office at Columbus, Ohio, and guarantee will be forwarded immediately.

The Buckeye Blower Company
Main Office 400 Dublin Avenue
COLUMBUS, OHIO

BUCKEYE
HEATOVENTS
are a
manufactured,
not an assembled
product hence
the Buckeye
Guarantee
covers all parts



The Plant back of
the Product



THE BUCKEYE BLOWER COMPANY

Main Office
& Factory

400 Dublin Ave.
Columbus, Ohio

